

REMARKS

Claims 1-10 are pending in this application with claim 1 being amended and claim 10 being added by this response.

The amendments to the claims were made for purposes of clarity. The applicant believes that these amendments are sufficient to distinguish the present claimed invention.

The amendments to claim 1 are provided to clarify the difference between video data words which are video signal samples having N bits (usually 8 bits) and that the sub-field code words having N+X bits (e.g. 10 or 12 bits). Support for this amendment is found throughout the specification and specifically in figures 2-4 and the accompanying disclosure on page 8, line 5-page 9, line 20.

New claim 10 is an apparatus claim patterned after original method claim 5.

Rejection of Claims 1, 2, 7 and 8 under 35 USC § 103(a)

Claims 1, 2, 7 and 8 are rejected under 35 U.S.C. 103(a), as being unpatentable over Kawahara et al. (European Patent No EP-A-0 893 916) in view of Okano et al. (European Patent No. EP-A-0 720 139).

The present claimed invention recites of an apparatus and method for processing video pictures for display on a display device having a plurality of luminous elements. Each element corresponds to the pixels of a picture. The time duration of a video frame or video field is divided into a plurality of sub-fields during which the luminous elements can be activated for light emission in small pulses corresponding to a sub-field code word. These code words are used for brightness control. Additionally each sub-field has a specific sub-field weight. The video signals for the pixels of a picture are then sampled. Video signal samples are represented by video data words having N bits. Sub-field code words having N + X bits with N and X being integer numbers are assigned to the video data words. Motion estimation motion vectors are calculated for pixels in a video picture which are used to determine corrected sub-field code words for pixels. A motion vector calculation is made separately for one or more color components of a pixel. For motion vector calculation, the sub-field code words have N + X bits and are used as data input instead of the video data words having N bits for a color component. Motion vector calculation is done based on the complete sub-field code words or based on code words that are formed from the entries in the sub-field code words of only a sub-group of sub-fields from the plurality of sub-fields. The motion vector defines a trajectory along which corrected sub-field code words will be placed.

The present claimed invention teaches of a system for solving the problem of dynamic false contour effects on plasma display panels. A method for calculating motion vectors separately for a group of sub-fields from the plurality of sub-fields is used to achieve that goal. The following method as claimed in claim 1 represents the inventiveness in calculating the motion vectors:

“the video data words sub-field code words are assigned having N + X bits, N and X being integer numbers, wherein with motion estimation motion vectors

are calculated for pixels in a video picture, and these motion vectors are used to determine corrected sub-field code words for pixels”

Kawahara et al teaches a method for processing video pictures for displaying on a display device, wherein the time duration of a video frame or video field is divided into a plurality of sub-fields during which the pixels can be activated for light emission in pulses corresponding to a sub-field code word which is used for brightness control, wherein each sub-field is assigned a specific sub-field weight (the luminance weight), wherein motion vectors are used to determine corrected sub-field code words for pixels. However, as admitted by the examiner, Kwahara et al neither discloses nor suggests how to calculate motion vectors. Thus, Kwahara neither discloses nor suggests” wherein the video signals for the pixels of a picture are sampled, said video signal samples are represented by video data words having N bits, wherein to the video data words sub-field code words are assigned having N + X bits, N and X being integer numbers, wherein with motion estimation motion vectors are calculated for pixels in a video picture, and these motion vectors are used to determine corrected sub-field code words for pixels, wherein, a motion vector calculation is being made separately for one or more colour components of a pixel, wherein for the motion vector calculation the sub-field code words having N + X bits are used as data input instead of the video data words having N bits for a colour component” as in the present claimed invention.

Okano teaches of a system which provides a method for correcting pixel data in a self-luminous display panel driving system, where the false contouring is prevented. One field of a composite video signal is divided into N sub-fields with luminance of each pixel set by a pixel data comprising N bits corresponding to the number of the sub-field and each of digit positions.

The examiner cites page 7, lines 30-31 and figure 10 to support his contention that Okano teaches a method for calculating motion vectors separately for group of sub-fields from a plurality of sub-fields. However, on page 7, lines 6-7 of Okano is it explained that pixel data A and B are applied to an inter-frame change detecting circuit 22. B refers to the pixel data of one frame before the current frame A.

It is clear from Okano that pixel data A and B is standard 8 bit video data.

Okano's system uses a "video signal processing circuit 1" which "extracts from the composite video signal, R video signal corresponding to a red video component, G video signal corresponding to a green video component and B video signal corresponding to a blue video component. The R, G and B video signals are applied to an A/D converter 3" (page 3, lines 55-58). The A/D converter is then used to "convert the R video signal, G video signal and B video signal into pixel data signal for each pixel" (page 4, lines 3-4). The length of each signal is then defined on page 4, lines 4-5 as "an 8-bit pixel data, the eight digits of which corresponds to the number of sub-fields". The pixel data from the A/D converter is fed into a "one-frame delay circuit" (page 7, lines 6-7). The pixel data from before the one-frame delay circuit as well as the pixel data from after the one-frame delay circuit "are applied to an inter-frame change detecting circuit 22" (page 7, line 10). The conversion of 8 bit video data into 10 or 12 bit sub-field code words is not shown in the Okano reference. Okano is specific in that the 8 bit video data is directly used for display driving as well, i.e. the sub-field code words are identical with the standard 8 bit video values, see page 4, lines 4-5. There is no step of sub-field coding disclosed, i.e. there is no step of assigning to the 8 bit video data dedicated $8 + x$ bit sub-field code words. Therefore, there is no enabling disclosure for the feature of using real sub-field code words as an input for the motion estimators.

In light of the above clarification it is seen that although Kawahara does disclose a method for processing video pictures for displaying on a display device, wherein the time duration of a video frame or video field is divided into a plurality of sub-fields, Okano does not suggest nor disclose a system in which "the video data words sub-field code words are assigned having $N + X$ bits, N and X being integer numbers, wherein with motion estimation motion vectors are calculated for pixels in a video picture, and these motion vectors are used to determine corrected sub-field code words for pixels". Therefore, it is respectfully submitted that there is no 350 SC 112 complaint enabling disclosure in either Kawahara et al or Okano which would make the present claimed invention unpatentable. It is thus, respectfully submitted that Kawahara et al when viewed alone or in combination with Okano does not make the present claimed invention

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unpatentable. It is still further respectfully submitted that this rejection is satisfied and should be withdrawn.

Claims 3-6 and 9 have been indicated as allowable. In view of the remarks and amendments to the claims it is respectfully submitted that all pending claims (claims 1-10) are now allowable.

Having fully addressed the Examiner's rejections, it is believed that, in view of the preceding amendments and remarks, this application stands in condition for allowance. Accordingly then, reconsideration and allowance are respectfully solicited. If, however, the Examiner is of the opinion that such action cannot be taken, the Examiner is invited to contact the applicant's attorney at the phone number below, so that a mutually convenient date and time for a telephonic interview may be scheduled.

No fee is believed due. However, if a fee is due, please charge the additional fee to Deposit Account 07-0832.

Respectfully submitted,
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